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10/619,103	07/14/2003	Junichi Ishizuka	F-7859	5800

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EXAMINER	
DEHGHAN, QUEENIE S	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/619,103	**Applicant(s)** ISHIZUKA, JUNICHI	
	Examiner QUEENIE DEHGHAN	**Art Unit** 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _13 July 2009_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _2-5,7,8,11,12,19 and 21-28_ is/are pending in the application.

4a) Of the above claim(s) _3 and 4_ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _2, 5,7,8,11,12,19 and 21-28_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 13, 2009 has been entered.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 2, 5, 7, 12, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (JP 60-171234) in view of Budinski et al. (6,305,194) and Takano et al. (JP 1226746). Shimizu disclose a method for molding lens by heating and compressing a lens preform between oppositely placed first and second cores (2', 1') by advancing the end part of the first molding core in a direction of the second molding core, each having an end part comprising a compression molding surface (figure 3, abstract). Shimizu et al. also teach an intermediate restrictor (3) comprising a predetermined outer radial dimension and an opening defining an inner peripheral surface which forms an inwardly facing radial boundary, wherein the outer radial dimension being greater than an outermost radial dimension of both the first and second cores, and the end part of the first molding core have a radially outer dimension which

receivably and conformably fits into the opening of the intermediate restrictor (drawings 3 & 4, abstract). Furthermore, the first molding core traverses an axial extent of the inner peripheral surface of the restrictor, wherein the inner peripheral surface has a substantially constant diameter over the axial extent. An axial extent is interpreted as a portion along the axial path traversed by the core. Accordingly, a significant portion of the axial path traversed by the core along the inner peripheral surface has a substantially constant diameter. Also, the end part of the second molding core has a radially outer dimension that is larger than the radius of the opening of the intermediate restrictor and smaller than the outer radial dimensions of the intermediate restrictor, so that the intermediate member is positionably supported on a platform formed on the end part of a second molding core (1'), wherein an axis of the second molding core is collinear with an axis of the opening. Shimizu et al. also position the lens preform (10) and the end part of first molding core (2') in the opening of the intermediate restrictor, so that the end part opposes the end part of the second molding core and an axis of the first molding core is collinear with an axis of the opening (abstract).

2. However, Shimizu fails to disclose a molding surface with depression or projections. Budinski et al. teach a method for molding lens by heating and compressing a lens preform between molding cores, just as Shimizu does. Budinski also further teach compression molding surfaces on the cores, wherein at least one of the molding surfaces comprises depressions formed on the surfaces for transferring and molding a plurality of convex or concave elements (Fig. 5 col. 1 lines 40-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made

to utilize a molding core with depressions, such as Budinski, as a variation of the molding core surface of Shimizu in order to produce multiple micro lenses at the same time from just one preform.

3. Furthermore, it is well known in the art that the starting glass element for molding often does not have the shape of the receiving area of the mold (hence the need for molding the glass) and that the receiving area is often larger than the glass element in order to fit the generically shaped glass element. Instead, only when the opposing molds are brought together in compressing the glass element, does the glass element take on the shape of the area defined by the molds and restrictor. Naturally, it would reasonable to expect the compression of the molds onto the glass elements would force material radially outward until it contacts the inner peripheral surface, as that is the only direction the glass material can travel. These concepts are further exemplified and supported by Takano et al., who discloses a compression molding method comprising positioning a lens preform and the end of a molding core within an opening of a restrictor, a receiving area bounded by the radial boundary of the restrictor being greater than a corresponding area occupied by the lens preform prior compression molding, thereby defining a gap between a periphery of the lens preform and said inner peripheral surface, and the compression molding being effective to force material of the lens preform radially outward to contact the inner peripheral surface, while the peripheral surface operates to prevent the material of the lens preform from escaping in an outward direction perpendicular to a compression direction of the lens preform (figures 1 & 2, abstract). Accordingly, it would be reasonable to expect the receiving

area bounded by the radial boundary of the restrictor to be greater than the corresponding area occupied by the lens preform prior to compression molding, thereby defining a gap between a periphery of the lens preform and said inner peripheral surface.

4. Regarding claim 2, Budinski further teaches performing the compression of the preform in vacuum (col. 7 lines 4-6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize vacuum in the process of Shimizu in order to minimize void formations in the lenses.

5. Regarding claim 7, Shimizu et al. discloses an end part of the first molding core that has a smaller outer radius than the outermost radial dimension of the second molding core in figure 3.

6. Regarding claims 12 and 19, Shimizu discloses a restrictor that is positioned to restrict a flow of the lens preform during heating and compressing of the lens preform, thereby forming lens with a shape and size of high accuracy. Budinski et al. also disclose the molding of a lens preform to closely conform to each of the said depressions or projections and thereby homogenize an optical performance of all the lens elements of the lens preform (col. 4 line 62 to col. 5 line 15), similar to Shimizu.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (JP 60-171234) in view of Budinski et al. (6,305,194) and Takano et al. (JP 1226746), as applied to claim 5 above, in further view of Takagi et al. (5,817,616). Budinski and Shimizu fail to specifically disclose a first molding core with an end part that has a radius smaller than the outermost radial dimension of the first molding core.

Takagi teaches an optical element molding method that comprises a first and second molding core as well as a restrictor (figure 1). Furthermore, Takagi teaches a first molding core that has an end part with a radius that is smaller than the outermost radial dimension of the first molding core (flange 3c in figure 1). Having a flange section of the molding core allows for a contact surface between the molding core and the restrictor, and therefore forming a gap. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize such an embodiment of the first molding die of Takagi in the process of Shimizu and Budinski in order to provide a gap that determines the thickness of the optical element formed, as taught by Takagi.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (JP 60-171234) in view of Budinski et al. (6,305,194) and Takano et al. (JP 1226746), as applied to claim 5 above, in further view of Ikeuchi et al. (JP 03-146427). Shimizu and Budinski fail to specifically disclose molding cores with the same outermost radial dimensions. Ikeuchi et al. teach a method for molding optical elements comprising a mold with a first (4) and second (3) molding cores, wherein the second molding core has a radial dimension that larger than the opening of the restrictor (5) so that a platform is for positioning the restrictor is formed and wherein the first molding core has end part (4c) that has a radius smaller than the opening of the restrictor. Furthermore, Ikeuchi teaches first and second molding cores with outermost radial dimensions that are same and a restrictor that is between the first and second molding cores (figure 1). Absent of any unexpected results from utilizing molding cores that have outermost radial dimensions that are the same and restrictors located between the

molding cores, one of ordinary skill in the art at the time of the invention would reasonably employed molding cores and a restrictor with portions not directly involved with the molding of the optical surfaces of the optical element to have any desired shape to fit the overall apparatus employing the molding core, such as the molding cores of Ikeuchi with outermost radial dimensions that are the same and the restrictor between the cores. The above combination of familiar elements, such as a platform for the restrictor, a first molding core with a smaller radius than the opening of the restrictor, the same outermost radial dimension of the molding cores, and a restrictor located between the molding cores yields predictable results of producing the desired optical elements.

9. Claims 21-22, 25-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takano et al. (JP 1-226746) in view of Marechal et al. (4,481,023) and Budinski et al. (6,305,194). Takano discloses a method comprising providing a first and second core with a depression on the compression molding surfaces for molding convex lens elements, providing a restrictor with an opening bound by an inner peripheral surface, where at least one portion of the first/second core is conformably receivable within the opening, setting a lens preform in the opening, compression molding the preform between the cores and restrictor, a receiving area bounded by the inner peripheral surface of the restrictor being greater than the corresponding area occupied by the preform prior to the compression molding, thereby defining a gap between a periphery of the preform and inner peripheral surface, the compression molding being effective to force material of the lens preform radially outward to contact

the inner surface of the peripheral surface, the inner peripheral surface operating to prevent the material of the lens preform from escaping in a direction perpendicular to a compression direction of the lens preform (figures 1 & 2, abstract). Furthermore, the inner peripheral surface has a substantially constant diameter over an axial extent traversed by the first core during compression molding. Takano also disclose heating the lens preform, but is not specific on whether the cores and restrictor is also heated. Marechal et al. teaches a compression molding process comprising of heating a first core, second core, restrictor and lens preform, wherein the cores are made of stainless steel (col. 6 lines 20-25, col. 7 line 59 to col. 8 line 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to have also heated the molding cores and restrictor of the Takano to ensure thermal equilibrium between the glass and the parts that come in contact with the glass.

10. Takano teaches forming a depression on the compression molding surfaces, but does not express multiple depressions or projections. Budinski et al. teach a method for molding lens by heating and compressing a lens preform between molding cores, just as Takano does. Budinski also further teach compression molding surfaces on the cores, wherein at least one of the molding surfaces comprises depressions formed on the surfaces for transferring and molding a plurality of convex or concave elements (Fig. 5 col. 1 lines 40-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a molding core with depressions, such as Budinski, as a variation of the molding core surface of Shimizu in order to produce multiple micro lenses at the same time from just one preform.

11. Regarding claim 22, Takano discloses a glass lens element, which the multiple lenses produced by the multiple depressions of Budinski would also result in each of lens elements comprising of a glass element.

12. Regarding claim 26, Takano does not express performing the molding in vacuum. Budinski teaches performing the compression of the preform in vacuum (col. 7 lines 4-6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize vacuum in the process of Takano in order to minimize void formations in the lenses.

13. Regarding claim 28, Takano discloses a molding core with a tip part that is inwardly displaced radially from the remainder of the rest of the core.

14. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takano et al. (JP 1-226746), Marechal et al. (4,481,023) and Budinski et al. (6,305,194), as applied to claim 21 above, in further view of Shimizu et al. (JP 60-171234). Takano fail to disclose the shape of the opening provided for by the restrictor. Shimizu teaches a molding core with a restrictor, wherein the opening bounded by the restrictor is circular (figure 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to have employed to have employed a design choice such as a circular lens array depending on the desired application of the final lens product.

15. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takano et al. (JP 1-226746), Marechal et al. (4,481,023) and Budinski et al. (6,305,194), as applied to claim 21 above, in further view of Ariyoshi et al. (2003/0072080). Takano fail to disclose the shape of the opening provided for by the restrictor. Ariyoshi teaches that

a microlens array can be a variety of shapes including circular and rectangular depending on desired effect of the lens one skill in the art is trying to achieve, such as the viewing angle ([0070]). Clearly, to obtain a rectangular microlens array, the opening of the restrictor in a compression molding apparatus would naturally be rectangular also. It would have been obvious to one of ordinary skill in the art at the time of the invention to have employed to have employed a design choice such as a rectangular microlens array depending on the desired application of the final lens product.

16. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takano et al. (JP 1-226746), Marechal et al. (4,481,023) and Budinski et al. (6,305,194), as applied to claim 21 above, in further view of Yoneda et al. (2005/0172671). Takano does not disclose cooling with nitrogen. Yoneda teaches a compression molding process wherein the glass lens element is cooled rapidly after molding by charging nitrogen gas into a surrounding part of the first and second cores and restrictor ([0088]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize nitrogen in the cooling of the lens of Takano after molding in order to expedite the cooling of the lens element.

Response to Arguments

2. Applicant's arguments filed July 13, 2009 have been fully considered but they are not persuasive. To summarize the applicant's arguments, the claim invention is directed towards a molding process that allows the glass to fill the cavity in between a first and second molding core and an intermediate restrictor, such that the inner surface of the restrictor exerts a force back at the glass as compression is applied by the first and

second cores. The applicant further argues this counter pressure is not present in the Shimizu reference. The examiner disagrees. The process of Shimizu does allow for the glass to fill the cavity between the first and second molding cores and the restrictor. Since the glass completely fills the cavity, the inner surface of the restrictor does exert a counter pressure on the glass as it is compressed (as demonstrated by the resulting shape of the glass element in figure 5). It is this counter pressure that allows for the glass to be pushed upwards to form section 5a. More importantly, the effective areas of the resulting lens is completely formed, which is a similar concern shared by the applicant. Furthermore, the modification of the Takano and Shimizu references to adapt the molding surfaces of the molding core to have projections and depressions is obvious, as it is common to employ a mold of a given choice to achieve the desired shaped for the resulting lens element.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to QUEENIE DEHGHAN whose telephone number is (571)272-8209. The examiner can normally be reached on Monday through Friday 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Queenie Dehghan/
Examiner, Art Unit 1791